We claim:

1. A method for increasing evaporation of a process water pond, the method comprising:

transferring process water from the process water pond into thermal communication with steam from a steam turbine; and

transferring the process water from thermal communication with the steam to the process water pond.

2. The method of claim 1, wherein the step of transferring process water into thermal communication includes pumping the process water through a steam condenser, and the step of transferring process water from thermal communication includes pumping the process water from the steam condenser to the process water pond.

3. The method of claim 2, wherein the step of pumping process water through a steam condenser includes pumping the process water through tubing of the condenser at a rate of about 10 ft/sec or greater.

4. The method of claim 2, wherein the steam condenser includes a low-pressure exhaust steam condenser, and the method further comprises receiving low-pressure exhaust steam from the steam turbine into the condenser for transferring thermal energy from the low-

pressure steam to the process water and thereby allowing the steam to condensate into turbine feedwater.

5. The method of claim 1, wherein for the steps of transferring the process water has a pH of about 1 to 5.

6. The method of claim 1, wherein for the steps of transferring the process water has a pH of about 1 to 3.

7. The method of claim 1, wherein for the steps of transferring the process water has a pH of about 2.1 to 2.3.

8. The method of claim 1, wherein for the steps of transferring the process water includes phosphoric acid.

9. The method of claim 8, wherein the process water further includes sulfuric and fluosilicic acids.

10. The method of claim 1, wherein the process water includes at least one of the substances selected from the group consisting of calcium, sulfate, magnesium, sodium, potassium, chloride, fluoride, ammonia nitrogen, silica, and fluosilicates.

11. A method for increasing the evaporation rate of a process water pond, the method comprising:

circulating coolant between a pond water heat exchanger in thermal communication with process water from the process water pond and a turbine heat exchanger in thermal communication with steam from a steam turbine; and

transferring process water from the process water pond through the pond water heat exchanger for receiving thermal energy from the coolant; and

returning the heated process water from the pond water heat exchanger to the process water pond.

12. The method of claim 11, wherein for the step of circulating the turbine heat exchanger includes a condenser.

13. The method of claim 12, wherein the condenser includes a low-pressure exhaust steam condenser.

14. The method of claim 13, further comprising receiving low-pressure exhaust steam from the steam turbine into the low-pressure exhaust steam condenser for transferring thermal energy from the low-pressure steam to the coolant.

15. The method of claim 11, wherein for the steps of circulating, transferring and returning, the process water has a pH of about 1 to 5.

16. The method of claim 11, wherein for the steps of circulating, transferring and returning, the process water includes phosphoric acid.

17. The method of claim 11, wherein for the steps of circulating, transferring and returning, the process water includes at least one of the substances selected from the group consisting of calcium, magnesium, sodium, potassium, chloride, fluoride, sulfate, ammonia nitrogen, sulfuric acid, fluosilicic acid, silica, and fluosilicates.

18. A method of controlling the volume of process water in a process water pond, the method comprising:

on condition the volume of process water in the process water pond reaches a predetermined high volume level, transferring thermal energy from a power plant to the process water pond; and

on condition the volume of process water in the process water pond reaches a predetermined low volume level, transferring thermal energy from the power plant to a cooling tower.

19. The method of claim 18, wherein the step of transferring thermal energy from the power plant to the process water pond includes:

circulating a coolant between a pond water heat exchanger in thermal communication with process water from the process water pond and a turbine heat exchanger in thermal communication with steam from a steam turbine; and

transferring process water from the process water pond through the pond water heat exchanger for receiving thermal energy from the coolant; and

returning the heated process water from the pond water heat exchanger to the process water pond.

20. The method of claim 18, wherein the step of transferring thermal energy from the power plant to the process water pond includes:

transferring process water from the process water pond into thermal communication with steam from a steam turbine; and

transferring the process water from thermal communication with the steam to the process water pond.

21. The method of claim 20, wherein the step of transferring thermal energy from the power plant to the process water pond further includes receiving low-pressure exhaust steam from the steam turbine into a condenser for transferring thermal energy from the low-pressure steam to the coolant.

22. The method of claim 18, wherein for the steps of transferring the process water has a pH of about 1 to 5.

23. The method of claim 18, wherein for the steps of transferring the process water includes phosphoric acid.

24. The method of claim 18, wherein for the steps of transferring the process water includes at least one of the substances selected from the group consisting of calcium, magnesium, sodium, potassium, chloride, fluoride, sulfate, ammonia nitrogen, sulfuric acid, fluosilicic acid, silica, and fluosilicates.

25. A method of capturing substances dissolved in or suspended in process water of a process water pond, the method comprising:

transferring thermal energy from a power plant to the process water pond for concentrating the process water from a first concentration to a second concentration;

pumping the concentrated process water with the second concentration to a production facility; and

using the concentrated process water with the second concentration in a production process.

26. The method of claim 25, wherein the step of transferring includes:

transferring a portion of the process water from the process water pond into thermal communication with steam from a steam turbine of the power plant; and

transferring the portion of process water from thermal communication with the steam to the process water pond.

27. The method of claim 25, wherein the step of transferring includes:

circulating coolant between a pond water heat exchanger in thermal communication with process water from the process water pond and a turbine heat exchanger in thermal communication with steam from a steam turbine of the power plant;

transferring a portion of process water from the process water pond through the pond water heat exchanger for receiving thermal energy from the coolant; and

returning the heated portion of process water from the pond water heat exchanger to the process water pond.

28. The method of claim 25, wherein the substances include phosphoric acid.

29. The method of claim 28, wherein for the steps of transferring, pumping and using, the first concentration of process water includes process water containing about 0.5% to 2.0% phosphoric acid, and the second concentration of process water includes process water containing a greater percentage of phosphoric acid than the first concentration.

30. The method of claim 25, wherein for the step of using, the production process includes a phosphoric acid wet-process production method.

31. A method for reducing the volume of a stagnant process pond storing process water, the method comprising:

pumping a portion of the process water from the stagnant process water pond through a heat exchanger in thermal communication with turbine steam; and

pumping the portion of process water back to the stagnant process water pond.

32. The method of claim 31, wherein for the step of pumping the portion of process water from the stagnant process water pond the heat exchanger includes a condenser of a steam turbine.

33. The method of claim 31, wherein for the step of pumping the portion of process water from the stagnant process water pond the heat exchanger includes a pond water heat exchanger, and the process further includes circulating coolant between the pond water heat exchanger in thermal communication with process water from the process water pond and a turbine heat exchanger in thermal communication with steam from a steam turbine of the power plant.

34. The method of claim 31, wherein the stagnant process water pond includes an above-ground process water pond associated with a gypsum stack.

35. The method of claim 31, wherein the stagnant process water pond includes a below-ground process water pond remaining from a former production facility.

36. A power plant cooling system comprising:

a process water pond containing process water;

a heat exchanger for transferring thermal energy to the process water; and

a pump fluidly coupled to the process water and the heat exchanger for cycling a portion of the process water from the process water pond through the heat exchanger and back to the process pond.

37. The power plant cooling system of claim 36, wherein the heat exchanger includes a steam turbine condenser.

38. The power plant cooling system of claim 37, wherein the condenser includes stainless steel tubing.

39. The power plant cooling system of claim 38, wherein the stainless steel tubing includes 316L stainless steel.

40. The power plant cooling system of claim 38, wherein the stainless steel tubing is formed from stainless steel selected from a group consisting of Hastalloy C, Hastalloy G, Alloy 20, 904L, and Zirconium.

41. The power plant cooling system of claim 36, further including stainless steel piping connecting the process water pond and the heat exchanger.

42. The power plant cooling system of claim 41, wherein the stainless steel piping is formed from stainless steel selected from a group consisting of 316L, Hastalloy C, Hastalloy G, Alloy 20, 904L, and Zirconium.

43. The power plant cooling system of claim 36, wherein the pump produces a flow rate of about 20,000 gallons/min at about 80 feet of head with an intake depth of about 5 feet.

44. The power plant cooling system of claim 43, wherein the pump includes a vertical submersible turbine pump.

45. The power plant cooling system of claim 36, wherein the process water has a pH of about 1 to 5.

46. The power plant cooling system of claim 45, wherein the process water has a pH of about 1 to 3.

47. The power plant cooling system of claim 46, wherein the process water has a pH of about 2.1 to 2.3.

48. The power plant cooling system of claim 36, wherein the process water includes phosphoric acid.

49. The power plant cooling system of claim 48, wherein the process water further includes sulfuric and fluosilicic acids.

50. The power plant cooling system of claim 48, wherein the process water includes at least one of the substances selected from the group consisting of calcium, sulfate, magnesium, sodium, potassium, chloride, fluoride, ammonia nitrogen, silica, and fluosilicates.

51. The power plant cooling system of claim 36, wherein the heat exchanger transfers thermal energy from a coolant in thermal communication with the power plant to the process water, and the cooling system further comprises:

a condenser for transferring thermal energy from the power plant to the coolant;

a pump fluidly coupled to the condenser and the heat exchanger for circulating the coolant between the heat exchanger and the condenser.

52. The power plant cooling system of claim 51, wherein the condenser includes stainless steel tubing.

53. The power plant cooling system of claim 52, wherein the stainless steel tubing includes 316L stainless steel.

54. The power plant cooling system of claim 52, wherein the stainless steel tubing is formed from stainless steel selected from a group consisting of Hastalloy C, Hastalloy G, Alloy 20, 904L, and Zirconium.